



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/045,746	10/26/2001	Mamiko Miyanaga	SOEI/0013	9682
32588	7590	11/30/2005	EXAMINER	
APPLIED MATERIALS, INC. 2881 SCOTT BLVD. M/S 2061 SANTA CLARA, CA 95050			STINSON, FRANKIE L	
			ART UNIT	PAPER NUMBER
			1746	
DATE MAILED: 11/30/2005				

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/045,746

Applicant(s)

MIYANAGA ET AL.

Examiner

FRANKIE L. STINSON

Art Unit

1746

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 04 October 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-6 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-6 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of Reasons Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

Art Unit: 1746

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1, 5 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mori et al. (U. S. Pat. No. 6,673,262) in view of Shang et al. (U. S. Pat. No. 5,788,778).

Re claim 1, Mori is cited disclosing a cleaning method for a vapor phase deposition apparatus (see col. 2, lines 1 1-16 and col. 3, line 59 through col. 4, line 3) for forming film (tungsten, silicon, see col.3, lines 31-40) onto a substrate by introducing film forming gas into a chamber (the remote excitation chamber see col. 4, line 9), comprising: activating a cleaning gas including a compound containing fluorine atoms by exposure to microwaves (see col. 3, lines 49-52 and col. 4, lines 3-1 1) and then introducing the cleaning gas into a chamber (the reactor) where a cleaning temperature (see claim 7) is greater than the film forming temperature (500°C, see col. 7, Example 46*), that differs from the claim only in the specific recitation of the apparatus having a showerhead and the step of the showerhead being raised to a temperature greater than the temperature of the showerhead during film formation. It is understood by the examiner that the apparatus as described in the specification in Mori is a conventional Chemical Vapor Deposition (CVD) device similar to that as disclosed in the Shang reference. Where Shang discloses a showerhead (12) located in a deposition chamber (10), a remote excitation chamber (46) where cleaning gas having

Art Unit: 1746

fluorine atoms (see col. 6, lines 12-32) is excited by microwave energy and then introduced into the processor/reactor. Therefore, it is believed to be obvious to one having ordinary skill in the art to modify the method of Mori, to employ the same in an apparatus as taught by Shang, which includes a shower for the introduction of a cleaning gas, since the apparatus is deemed to be conventional as describe the Mori reference. As for the showerhead being raised to a temperature greater, during reactor/chamber cleaning, than the temperature during film formation, please note in Mori, where the film formation is carried out at a temperature of 500°C (col. 7, line 36). Mori further discloses that during clearing of the CVD apparatus (col. 4, line 1-2), the excited cleaning gas has a temperature of anywhere between 10°C-700°C. Thusly, when the cleaning gas is in the range 500°C-700°C, the showerhead as proposedly modified by Shang, it would inherently transfer the greater temperature to the showerhead. Re claims 5 and 7, Shang discloses the temperature as claimed.

3. Claims 2-4 rejected under 35 U.S.C. 103(a) as being unpatentable over the applied prior as applied to claim 1 above, and further in view of Matsuse et al. (U. S. Pat. No. 5,647,945).

Claims 2-4 define over the applied prior art only in the recitation of restriction of a cooling medium and the heater in the showerhead, for the purpose of raising the temperature of the showerhead. Matsuse is cited disclosing the raising of the temperature by restriction the flow of cooling medium ("COOLING WATER" as at 125, see fig. 6) and further discloses the heater (124). It therefore would have been obvious to one having ordinary skill in the art to modify the method/process of Mori, to include a

Art Unit: 1746

cooler/heater for the showerhead as taught by Matsuse. In the art various devices have been employed to either heat or cool, to employ one over another is merely a design choice since they are essentially the functional equivalent of each other (see MPEP 2144.06 SUBSTITUTING EQUIVALENTS KNOWN FOR THE SAME PURPOSE).

4. Applicant's arguments filed October 4, 2004 have been fully considered but they are not persuasive. In regard to the remarks on the Mori reference, namely that the same fails to disclose the limitation of the cleaning gas being supplied through a showerhead, please note the Shang discloses the arrangement. As for Matsuse's power supply being not being interchangeable, please note that Matsuse was only cited disclosing the arrangement of a showerhead being provided with a cooling and a heating medium.

5. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.


Art Unit: 1746

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to FRANKIE L. STINSON whose telephone number is (571) 272-1308. The examiner can normally be reached on M-F from 5:30 am to 2:00 pm and some Saturdays from approximately 5:30 am to 11:30 am.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Barr, can be reached on (571) 272-1700. The fax phone number for the organization where this application or proceeding is assigned is 571-272-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

fls


FRANKIE L. STINSON
Primary Examiner
GROUP ART UNIT 1746